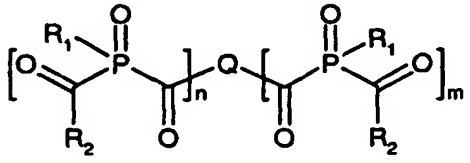
Claims

1. Dimer and multimer forms of BAPO compounds of the formula I



I

wherein

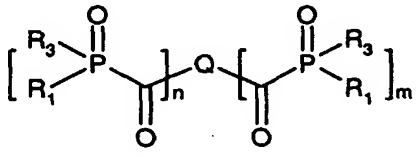
R_1 is unsubstituted or substituted C_1-C_{12}alkyl, benzyl, C_1-C_{12}alkoxy, C_3-C_6cycloalkyl or C_5-C_{14}aryl;

R_2 is unsubstituted or substituted C_3-C_6cycloalkyl or C_5-C_{14}aryl;

Q is a di-tri or tetravalent arylene residue;

n is 1-4, m is 0-2, n+m is 2, 3 or 4.

2. Dimer and multimer forms of MAPO compounds of the formula II



II

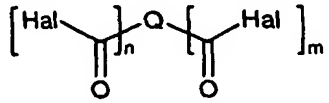
wherein

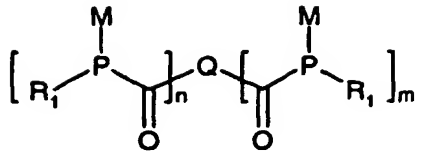
R_1 and R_3 independently of one another are unsubstituted or substituted C_1-C_{12}alkyl, benzyl, C_1-C_{12}alkoxy, C_3-C_6cycloalkyl or C_5-C_{14}aryl;

Q is a di-tri or tetravalent arylene residue;

n is 1-4, m is 0-2, n+m is 2, 3 or 4;

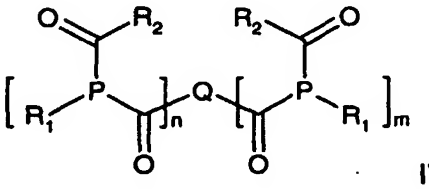
with the proviso, that R_1 and R_3 are different from each other.

3. Process for the preparation of dimer or multimer forms of BAPO compounds of the formula I and of dimer or multimer forms of MAPO compounds of the formula II, characterized in that (n + m) equivalents of a dimetalated-phosphine $R_1P(M)_2$ are reacted with one equivalent of a di-or polycarboxylic acid halogenide  to form an intermediate of the formula III



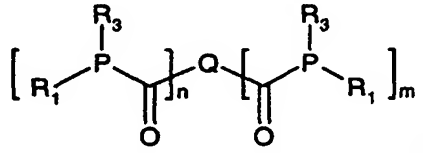
III

the intermediate is then reacted either with (n + m) equivalents of a further carboxylic acid halogenide **(R_2-CO-Hal)** to form dimer or multimer forms of **bisacyl**phosphine-intermediates of the formula IV



IV,

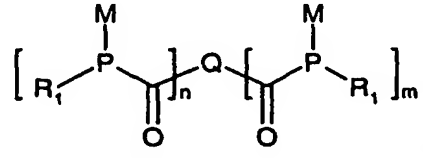
or with (n + m) equivalents of a halogenide **R_3-Hal** to form dimer or multimer forms of **monoacyl**phosphine intermediates of the formula V,



V,

said phosphines IV or V are then oxidized to form phosphine oxides of the formula I or II, wherein M is Li, Na or K; and R_1, R_2 and R_3; Q; n and m are as defined in claims 1 and 2.

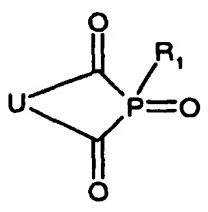
4. Compounds of the formula III



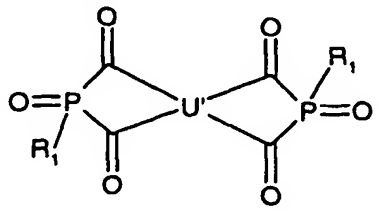
III

wherein M, R_1, n and m are as defined in claim 3.

5. Cyclic forms of BAPO compounds of the formula VI or VII



VI

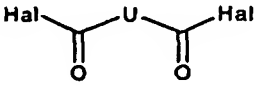


VII

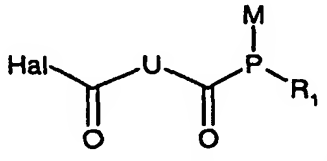
wherein

R_1 is unsubstituted or substituted C_1-C_{12}alkyl, benzyl, C_1-C_{12}alkoxy, C_3-C_6cycloalkyl or C_5-C_{14}aryl;

U is a divalent arylene residue and U' is a tetravalent arylene residue.

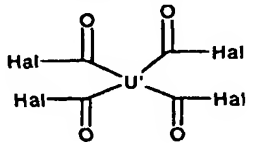
6. Process for the preparation of cyclic forms of BAPO compounds of the formula VI characterized in that one equivalent of a dimetalated-phosphine $R_1P(M)_2$ are reacted with one equivalent of a dicarboxylic acid halogenide 

to form an intermediate of the formula III'

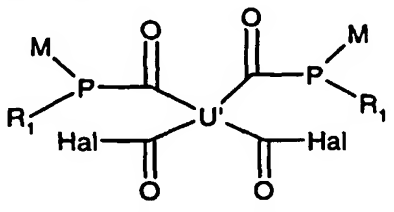


III'

said intermediate cyclizes and is then oxidized to form phosphine oxides of the formula VI, wherein M is Li, Na or K; R_1 and U are as defined in claim 5.

7. Process for the preparation of cyclic forms of BAPO compounds of the formula VII characterized in that two equivalent of a dimetalated-phosphine $R_1P(M)_2$ is reacted with one equivalent of a tetracarboxylic acid halogenide 

to form an intermediate of the formula III"



III"

said intermediate cyclizes and is then oxidized to form phosphine oxides of the formula VII wherein M is Li, Na or K; R_1 and U' are as defined in claim 5.

8. Process according to any one of claims 3, 6 or 7, wherein M is Li and wherein the process is carried out in an inert atmoshere at a temperature from -20 to 80°C.

9. Compounds according to any one of claims 1, 2 or 4, wherein n is 1 and m is 1.

10. Photopolymerizable composition comprising

(a) at least one ethylenically unsaturated photopolymerizable compound, and

(b) as photoinitiator, at least one compound of the formula I, II, VI or VII as defined above.